

belong to the genus *Khasiella*, with these shell-characters :—
Openly umbilicated; sharply keeled; spire very conoid, with
sides and apex very convex.

Nore, Godalming,
5th June, 1907.

XII.—*Descriptions and Records of Bees.*—XV.
By T. D. A. COCKERELL, University of Colorado.

Tripeolus Noræ, sp. n.

♀.—Length about $8\frac{1}{2}$ mm.

Black, with the usual markings only slightly yellowish; hair on middle of face pure white; legs clear red, spurs of middle and hind legs black; no red colour on thorax; tegulæ apricot-colour; scutellum low, obscurely bilobed, the lateral teeth black and short. Clypeus shining, with many very minute punctures and a few large ones; mandibles red except at base and apex; labrum black, a little reddish at sides; first three antennal joints and base of fourth ferruginous; sides of vertex with large well-separated punctures on a shining ground; mesothorax exceedingly densely punctured, the two median stripes of hair short, not attaining the anterior margin; pleura hairy in front and with a large transverse patch of hair; lower part of pleura densely punctured, but at one place a little of the shining surface shows; dark transverse mark on first abdominal segment essentially as in *T. occidentalis*, but the posterior band interrupted; segments 2 to 4 with even entire bands, that on 2 with lateral processes directed forwards so as to make with the band an angle of about 45° ; sides of fifth segment with white tomentum; last ventral segment normal.

In nearly all respects exactly like a small edition of *T. occidentalis*, but the hair of the abdomen is less yellow, the pygidial patch is narrower, and the scutellar teeth are less developed. In size and general appearance it closely resembles *T. callopus*, Ckll. The colour of the spurs will readily separate it from *T. Hopkinsi*.

Hab. Mesilla Park, New Mexico, at flowers of *Sphaeralcea lobata*, Wooton, May 16 (*Miss Nora Newberry*).

Tripeolus remigatus (Fabr.).

Mesilla, New Mexico, June 30 (*Cockerell*).

This is the true *remigatus*, as defined by Cresson and

Robertson, and is new to New Mexico. The species has a wide range eastward. Mr. N. Banks sends me specimens from Glencarlyn, Virginia, July 26, and Falls Church, Virginia, Aug. 7, ♀ at flowers of *Eupatorium linearifolium*.

Tripeolus agaricifer, sp. n.

♂.—Length 9 mm. or rather more.

Black, with the *markings orange-buff*, all the abdominal bands of the same colour; legs red, the coxæ and trochanters black, anterior femora black above except at apex, middle femora mainly black above and beneath, hind femora black, with a broad red stripe above; hind tibiæ with a large black patch behind; *spurs red*. Middle of mandibles red; labrum black; *hair of face orange*; antennæ black, the third joint with a large red mark in front; vertex very coarsely punctured; mesothorax very coarsely punctured, with two very distinct stripes which reach the anterior margin, which latter has no light border; markings of thorax as usual; tegulæ and most of tubercles red; scutellum entirely black, strongly bigibbous, with short but very distinct lateral teeth; lower part of pleura showing a black (but not entirely nude) area, which is densely and coarsely punctured. Wings with the apical margin broadly dark fuliginous; stigma red; nervures fuscous; second s.m. much narrowed above. Abdomen broad, with all the bands broad and perfectly entire, except the basal one on the first segment, which is rather broadly interrupted; black median mark on first segment transversely fusiform, with obliquely truncate sides, much shorter than in *T. helianthi*, but not triangular as in *T. lunatus*; band on second segment with a broad low prominence on each side in front, but no projection forming an angle; apical plate black, narrow.

Looks at first sight like a small *T. lunatus*, but easily separated by the characters italicized.

Hab. Beulah, New Mexico, August (Cockerell).

The name *agaricifer* is derived from the black mark on the first abdominal segment, which, when the insect is seen from the front, looks like an agaric.

Epeolus argyreus, sp. n.

♂.—Length about $8\frac{1}{2}$ mm.

Black, but largely covered with the usual pubescence, which on the abdomen is pale cinereous with a yellowish tint, on the thorax above the same, but on the face and pleura (both of which are entirely and densely covered) brilliant

silvery white. Eyes pale green. Antennæ brown-black, the third joint partly red. Mesothorax covered with appressed hair, except a somewhat U-shaped patch posteriorly; area of metathorax nude, surrounded by dense hair on all sides; tegulæ very hairy, piceous, with reddish margins. Wings hyaline; in the type the upper half of the second t.-c. is wanting on both sides. Legs black, with silvery hair, that on inner side of basitarsi golden; small joints of tarsi ferruginous; spurs of middle and hind legs black; first abdominal segment covered with light hair, except a slender transverse band, which is only moderately long and is ill-defined at the ends; all the light bands entire and broad, that on second segment greatly enlarging laterally, but the enlargement forming with the band a very obtuse angle; erect fringe on fourth and fifth ventral segments fuscous.

Hab. North Yakima, Washington State, Aug. 4, 1903 (*Eldred Jenne*).

Epeolus bihamatus, sp. n.

♂.—Size, colour, and general appearance agreeing with *E. argyreus*, with the same silvery hair covering the pleura, though not quite so densely, and also on the face, though failing below, so as to leave the lower part of the very minutely and densely punctured clypeus visible. The black spurs also are the same, and the hyaline wings. The following differences are important:—Mandibles with more red; margin of labrum red; face less narrowed below; third antennal joint longer; flagellum ferruginous beneath except at base; mesothorax less hairy, leaving a large anchor-shaped black area very densely punctured, its stem reaching the anterior margin; tegulæ piceous basally, red in the middle, and with hyaline margin; area of metathorax almost entirely covered with hair; marginal cell less slender; second t.-c. complete; knees, femora, and tibiæ red; transverse band on first abdominal segment large and clean-cut; band on second segment with a large hook-like process on each side; erect fringe on fourth and fifth ventral segments white.

Hab. North Yakima, Washington State, June 26, 1903 (*Eldred Jenne*).

This species and the last are very distinct by the general appearance and hairy pleura, together with the black spurs, from the other American members of the genus.

The following three species of *Triepeolus* superficially resemble *T. lunatus* and *helianthi*, and were confused with

those species until critically examined. A table is offered to facilitate their separation:—

Females.

Black mark on first abdominal segment distinctly triangular, the lateral corners pointed	<i>lunatus</i> , Say.
Black mark on first abdominal segment a transverse band	1.
1. Anterior femora red	<i>segregatus</i> (Ckll.).
Anterior femora black, or black with a red stripe.	2.
2. Pleura hairy all over, though more thinly below.	<i>Townsendi</i> , Ckll.
Lower part of pleura bare	<i>helianthi</i> , Rob.

Males.

All, or nearly all, of the abdominal bands narrowly interrupted	<i>sublunatus</i> , Ckll.
The bands beyond the first segment all, or nearly all, entire	1.
1. Larger; anterior femora black; pleura hairy all over	<i>Fraseræ</i> (Ckll.).
Smaller; anterior femora red and black, or red.	2.
2. Pleura hairy all over	<i>Townsendi</i> , Ckll.
Lower part of pleura bare or little hairy	<i>segregatus</i> (Ckll.).

Tripeolus sublunatus, sp. n. (*Cressonii*, Rob., race?).

♂.—Length 11 mm.

With a relatively long and narrow, cylindrical abdomen. Hair of face distinctly yellowish. Labrum, basal part of mandibles, and first three joints of antennæ red; the two stripes on mesothorax very clear and distinct; no band along anterior border of mesothorax, or patches of hair in the anterior corners; tegulæ bright ferruginous. Wings dusky; lower part of pleura with a bare, very densely punctured patch. Legs red, the anterior femora black, with the apex and the lower edge red; middle and hind femora with much black in front; spurs of middle and hind legs black; transverse band on first abdominal segment with broad anterior and posterior projections, the latter dividing the apical light band; all the abdominal bands practically of the same colour.

By the colour of the tegulæ this species is like *T. occidentalis*, Cresson, but it differs from that by the dark femora and interrupted abdominal bands. In Robertson's table (Canad. Entom., Oct. 1903) it runs to *T. Cressonii*, Rob., and agrees with the diagnosis there given, except as to the pleura. According to Robertson, *Cressonii* as found in Illinois is exceeding variable, and it may be that *sublunatus* represents a geographical form

of it *. In our insect the scutellum and tubercles show no red whatever, and the teeth at the sides of the former are very little developed. The second abdominal segment has the band hooked at the sides in one specimen, but the hook-like projection is wanting in the other, which is certainly conspecific. The marking of the mesothorax is very different from that of *Fraserae*, which I described as a subspecies of *Cressonii*.

Hab. Dripping Spring, Organ Mts., New Mexico, Aug. 10 (C. H. T. Townsend). Two males.

Tripeolus segregatus (Ckll.).

♂.—Length about 10 mm.

Compact; labrum black and mandibles with little red; clypeus very densely punctured; hair of face silver-white. Antennæ black, or scape with a red spot in front, and third segment and base of fourth red; the two stripes of mesothorax very distinct; no pale anterior border; scutellum entirely black, the lateral teeth pointed but not long; pleura with a nude patch below, on which are scattered strong punctures on a shining ground; femora entirely red, or with suffused dusky patches.

♀.—Scutellum entirely black; the abdominal bands beyond the first segment entire, or that on the second inclined to be interrupted.

The female ascribed to *segregatus* in the original description probably represents a distinct species, or at least variety. I was misled by it into thinking the present insect distinct from *segregatus*, but I cannot see that the males are anything but true *segregatus*, and the females taken at the same time and place certainly belong with them. The insect is related to *T. pectoralis*, Rob., but the black band on the first abdominal segment is not so long, the tegulæ are differently coloured, and there are other differences. The spurs are brown, not black.

Hab. Dripping Spring, Organ Mts., Aug. 10, 2 ♂, 2 ♀ (C. H. T. Townsend).

Tripeolus Townsendi, sp. n.

In size, colour, and markings just like the *T. segregatus* from the Organ Mts., but differing as follows:—

* However, *E. Cressonii* was based primarily on the *mercatus* of Cresson (1878), and Cresson's full description appears to indicate an insect specifically distinct from *sublunatus*. Virginia is to be taken as the type locality.

♂.—The two stripes of mesothorax broader, broadly reaching anterior margin, and more or less connected with large patches of pale hair which occupy the anterior lateral corners; pleura densely covered with hair; teeth at sides of scutellum somewhat longer and appreciably curved inwards; spurs of middle and hind legs black; black band on first abdominal segment longer, rounded instead of obliquely truncate laterally, and without an anterior projection breaking the basal pale band; angles formed by lateral processes of band of second segment less acute; apical plate rounded. The antennæ and labrum are entirely black, and there is no red about the thorax.

♀.—Antennæ black; anterior lateral corners of mesothorax with pale patches; teeth at sides of scutellum smaller; pleura hairy, the lower part densely punctured. Wings hardly so dark; spurs black; apical pale band of first abdominal segment more broadly interrupted, but basal band not interrupted.

Hab. Rio Ruidoso, New Mexico, about 6700 ft., at flowers of *Erigeron macranthus*, July 27, ♂ (*C. H. T. Townsend*); Rociada, New Mexico, Aug. 8, ♀ (*Cockerell*).

ISEPEOLUS, gen. nov.

♂.—Similar in appearance and markings to *Epeolus*, but differing as follows:—Third antennal joint very long, longer than the scape; apical half of galea slender and elongated; labial palpi very long (the last two joints minute as usual); axillar teeth present but rounded, blunt; b. n. falling far short of t.-m.; submarginal cells subequal, but the third the largest; the second large, square, a little shorter below than first or third, receiving first r. n. near its end; third s.m. receiving second r. n. near its end; outer side of third s.m. strongly bulging; marginal cell with its apex obliquely truncate, the tip away from the costa, the part of the lower edge joining the s.m. cells a trifle shorter than the part beyond; apex of abdomen rounded, without a projecting plate, the upper surface of it covered with fine hair. The maxillary palpi appear to be quite as in *Epeolus*. Claws bifid; a very long pulvillus, as long as the claws, with a black apical disk.

For years I have had this insect marked "*Leiopodus?*"; but having seen the type of *Leiopodus* in the British Museum, it is evident that *Isepeolus* is very distinct by the oval abdomen, large but not especially peculiar hind coxæ, second s.m. a little narrower below than first, &c.

Isepeolus albopictus, sp. n.

♂.—Length about $8\frac{2}{3}$ mm.

Black, with markings of white tomentum like those of *Epeolus*; mandibles rather feebly bidentate, dark reddish except at base; labrum black; face covered with white hair, but clypeus nearly all bare, dull and roughened with very minute punctures; apex of scape, and the following three joints entirely, red; the remaining part of the flagellum, which is stout, red beneath; mesothorax dull, with minute close punctures, anteriorly with two triangles of black hair surrounded by white, the anterior lateral corners also covered with white hair; tubercles red; upper part of pleura covered with white hair, lower part bare, densely punctured; scutellum bigibbous, red, with black hair at sides; postscutellum red, with white hair; metathorax black, the area bare; tegulæ reddish. Wings clear, the apical field with dusky stains; stigma well developed, red; nervures dark fuscous. Knees, anterior and middle tibiæ, apex and base of hind tibiæ, and all the tarsi red; anterior tarsi long and slender; anterior and middle tibiæ marked with two bars of white on the outer side, hind tibiæ with a broad bar or patch on apical half; hind femora swollen; spurs ferruginous; first abdominal segment with white hair at base, a spot at each side, and a pair of semicircular marks on hind margin; second segment with a broadly interrupted band on hind margin, its proximal ends subclavate, its upper lateral margin with a very large bifid process or extension; third segment ornamented like second, except that the band is obsolete in the subdorsal region, leaving the proximal ends as spots; fourth segment with a pair of spots; fifth with two transverse hammer-shaped marks; sixth four-spotted; apex red; venter dark brown, with some white hair-spots.

Hab. Carcarana, Argentina; received from Mr. J. C. Crawford. Collected, I believe, by Professor L. Bruner.

I believe there are other specimens in the U.S. National Museum.

GRONOCERAS, gen. nov.

Large bees allied to *Megachile*, with the nesting-habits (cf. *G. combusta*) of *Chalicodoma*: male with flagellum excavated beneath, like a trough; abdomen with two long spines at apex; anterior coxæ with very long spines; anterior tarsi pallid, broadened and flattened; claws bifid at apex: female with mandibles 2- to 4-dentate; scopa red or red and black; claws simple. The maxillary palpi are bristly.

The general build resembles that of *Chalicodoma*, but the structure of the apex of the abdomen and of the male antennæ is quite different.

Type, *G. Wellmani*, sp. n. Also including *G. combusta* (*Megachile combusta*, Sm.), *G. guineensis* (*Apis guineensis*, Fabr.), *G. tricolor* (*Megachile tricolor*, Friese), and *G. stuppea* (*Megachile stuppea*, Vachal).

Gronoceras Wellmani, sp. n.

♀.—Length 17–19 mm.

Black, including legs and antennæ, the hind margins of the abdominal segments ferruginous; hair of head, thorax, and legs black or brown-black, of abdomen bright fox-red, above and below, but largely black or dark fuscous on the first segment above; mandibles long, with two apical teeth, the rest of the cutting-edge toothless; clypeus normal, strongly punctured, the punctures well separated in the middle; mesothorax densely punctured and dull; tegulæ densely punctured, black, with dark ferruginous margin. Wings subhyaline, strongly yellowish.

Very nearly agreeing with *G. combusta*, but the wings are not nearly so dark.

♂.—Length 16–19 mm.

Like the female, except in the sexual characters mentioned in the generic diagnosis, but the hair of the first abdominal segment is red like that of the others (in *combusta* ♂ it is black); the hair of the face is light yellowish or yellowish white, with black hairs intermixed; the cheeks below have a fringe of long white hairs; the anterior tibiæ are more or less pale apically, with a little elevated keel in front; first basitarsus broad and flat, a sort of pale honey-colour, with a raised ferruginous keel or line along the outer anterior edge, short white hair on the outer surface, except basally and more or less anteriorly, where there are fuscous bristles, a fringe of dense short black hair on the anterior interior edge, and a long fringe of ferruginous-tipped hairs behind; second joint of anterior tarsus dark reddish or yellow, the remaining joints black, except that the tip of the last is red; extreme apex of middle tibiæ red; bases of claws red; red hind margins of abdominal segments very broad; venter of abdomen mainly red; apex of abdomen with some long dark hairs, and two long, straight, red-tipped spines, mesad of each (and springing from the same base) is a short inconspicuous spine; a red spine, easily overlooked, on each side of penultimate segment; anterior coxal spines long and

straight, reddish above. The second specimen, manifestly conspecific, has at the apex of the abdomen a pair of *short* black spines on one side and a single one on the other; it is asymmetrical and evidently abnormal. This male is also very like *G. combusta*, but separated by the much paler wings, red hair on first abdominal segment, form of apical teeth, &c.

Hab. Portuguese West Africa, long. E. 15° 05', lat. S. 12° 44', alt. 1360 metres, at flowering mint, *Æolanthus* sp., Dec. 1906 (middle of rainy season); two of each sex collected by Dr. F. Creighton Wellman.

Gronoceras benguellensis, sp. n.

♀.—Length about 16½ mm.

Black, including legs and antennæ; hair of head, thorax, and legs brown-black, except that there is a little pallid hair about the bases of the antennæ, and the hair of the thorax above is dark coffee-colour on the mesothorax, becoming bright fox-red on hind part of scutellum and upper part of metathorax; the hair of the first two abdominal segments above is bright fox-red, but on the others black, the hind margins of the segments narrowly whitish; ventral scopa red in the middle and black at the sides, but entirely black on the last two segments. Wings dusky hyaline, the apex clouded; hind spurs red; mandibles 4-dentate, the third tooth truncate, the fourth very small.

♂.—Length about 13 mm.

Hair of face yellowish white, of cheeks below white, of vertex and occiput brown-black, of thorax and abdomen brown-black, without red; whitish at sides of abdomen beneath; apex of abdomen with a large stiff tuft or brush of long black hairs; abdomen above practically bare, the hind margins of the segments dark reddish; clypeus densely punctured, with a narrow shining median raised line; middle of mandibles with a large tubercle beneath (in *Wellmani* with a similar process, but hardly so large); labrum broadly rounded at apex; anterior tarsi formed in general as in *Wellmani*, but the apical joints are red, not black, and the basitarsus is greyish, with no anterior ferruginous line, but with a broad cream-coloured stripe down the anterior margin, and continued on to the second joint; the fringe of hair on the inner anterior edge is pale reddish instead of black, and the long posterior fringe extends as far as the penultimate joint, and is fuscous for its upper half, ferruginous with a white base for its lower, *i. e.* from the last quarter of the

basitarsus on; anterior coxal spines well developed; spines at apex of abdomen long and straight, without any inner pair; the short sublateral spines are black.

Hab. Same locality and date as *G. Wellmani*; taken by Dr. Wellman at flowers of Compositæ, one of each sex.

Megachile caricina, sp. n.

♀.—Length about $10\frac{1}{2}$ mm.

Black, with broad head and broad shovel-shaped abdomen; hair of face pale yellowish, of cheeks white, of occiput pale, but about ocelli short and black; antennæ entirely black; mandibles 4-dentate; clypeus normal, strongly punctured, with a smooth, shining, discal area; hair of thorax white at sides and beneath, above black, with some whitish on mesothorax in front and in mesothoracico-scutellar suture; mesothorax and scutellum very densely punctured; tegulæ black. Wings strongly dusky. Hair of legs white, pale reddish on inner side of tarsi; hind basitarsus very broad and flat; claws simple; abdomen punctured, not strongly or closely, and without bands; apical segments above with coarse black bristles; scopa bright orange-red, but white basally and black on last segment.

♂.—Size about the same, as also general appearance.

Face densely covered with yellowish-white hair, a few dark hairs on each side near upper part of clypeus; black hairs on vertex; antennæ black; anterior tarsi quite simple; anterior coxæ with rather short but stout spines; metathorax and first abdominal segment with copious white hair; apex with a strong transverse keel, which is broadly emarginate but not serrate; no subapical ventral teeth; claws bifid at end.

This belongs to *Megachile*, s. str., as defined by Friese and Robertson. In its general appearance it is much like the American *M. mendica*, Cresson.

Hab. Same locality and date as *Gronoceras Wellmani*; 2 ♂, 1 ♀, taken by Dr. Wellman, the males marked "on flowering sedges, side of stream," the female "on sedges."

XIII.—Notes on the Habits and External Characters of the *Solenodon of San Domingo* (*Solenodon paradoxus*). By A. HYATT VERRILL*.

[Plate IV.]

ALTHOUGH *Solenodon paradoxus* of San Domingo and Haiti was discovered and imperfectly described as early as 1839,

* Reprinted from the Amer. Journ. Sci. for June 1907. From an advance proof communicated by the Author.